Remarks

In the Office Action mailed October 6, 2004:

1. Claims 1-3, 8-10 and 32 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,721,273 (Lyon);
2. Claims 5-7 were objected to, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims; and
3. Claims 11-22 and 24-31 were allowed.

I. Lyon (U.S. Patent No. 6,721,273)

Lyon is directed toward "Method and Apparatus for Traffic Flow Control in Data Switches" (title). Lyon cannot anticipate claimed embodiments of Applicant's invention, for the reasons stated below.

In Lyon, a data switch is provided for switching data cells. Each cell has a corresponding loss priority (indicating how preferable it is to drop that cell instead of another cell) and an emission priority (indicating how preferable it is to transmit that cell instead of another cell) (column 1, lines 52-56; column 1, lines 23-31). A traffic flow controller in the data switch translates the loss and emission priorities into a single probability for discarding a cell, which is termed the bandwidth priority (BP) and is consistent across different emission priorities (column 2, lines 8-11).

The traffic flow controller includes an accumulator for maintaining a count for each output port, wherein the count reflects a level of congestion in the output port (column 2, lines 51-53). The traffic flow controller also includes a register that stores at least one BP threshold for each output port (column 2, lines 57-60). A bandwidth priority threshold, as depicted and described in relation to FIG. 10, divides a virtual queue into BP levels (column 11, lines 8-21). The virtual queues model (and help manage) the output port's output queues (column 10, lines 27-49).

Furthermore, the traffic flow controller includes a controller for updating an output port's count, comparing the count to the port's threshold(s) and identifying the highest bandwidth priority level whose threshold was exceeded (column 2, lines 60-63; column 11, lines 22-30). The BP of cells to discard is determined from the highest BP level that was just identified, and a flow control message is sent to discard cells as necessary (column 2, lines 64-67).

A. Lyon's "Bandwidth Priority" Does Not Correspond to a Dynamic Weight Corresponding to a Threshold Amount of Data

Claimed embodiments of the invention (e.g., claims 1, 32) recite the maintenance of a "dynamic weight for each of said plurality of memories, wherein each said dynamic weight corresponds to a threshold amount of data." The dynamic weights are employed to help determine how much data to schedule from a memory during a scheduling turn.

As described above, a bandwidth priority (BP) in Lyon is a static function of a cell's loss priority and emission priority. Specifically, bandwidth priorities are assigned to incoming cells based on their emission and loss priorities (e.g., TABLE 1 and column 11, lines 31-47; TABLE 3 and column 16, lines 39-47). Thus, a cell's BP is not dynamic, and has no relation to any amounts or thresholds of data. Each incoming cell in Lyon is automatically assigned a BP without regard to how much data is stored in the output port the cell is destined for.

Thus, Applicant's use of dynamic weights for servicing memories cannot be anticipated by Lyon's assignment of static BPs to incoming cells.

B. Lyon Does Not Receive Descriptors or Data Described by Descriptors

In claimed embodiments of the invention (e.g., claims 1, 32), descriptors describing data portions (e.g., packets) are received during a memory's servicing turn, and data described by the descriptors are retrieved. The retrieved data may exceed a threshold amount of data associated with the serviced memory.

It appears that Applicant's descriptors were equated with a determination in Lyon as to whether a bandwidth priority (BP) threshold was exceeded (Official Action, page 3, lines 9-10). Applicant's serviced memories were compared with registers (Official Action, page 3, line 1), and Applicant's retrieved data with cells (Official Action, page 3, lines 11-13).

However, cells ("data") in Lyon are not described by determinations as to whether output queue BP thresholds were exceeded ("descriptors"), and so Lyon cannot anticipate Applicant's use of descriptors to describe data to be retrieved. As summarized above, in Lyon, a virtual queue corresponds to a particular emission priority, and mirrors an actual output queue. The virtual queue is divided by thresholds into bandwidth priority levels (FIG. 10). A virtual queue's count is determined, which falls into a particular BP level. This condition is interpreted to mean that the switch should start discarding incoming cells that (a) are destined for an output queue

having the same or higher emission priority, and (b) have lower bandwidth priorities (column 11, line 58 to column 12, line 4; column 12, lines 5-25).

Thus, Lyon teaches away from Applicant's invention in that Lyon teaches one to discard cells described by BP thresholds, not schedule them. Further, Lyon uses thresholds to determine how *little* data should be allowed to be queued (i.e., to limit congestion), not how *much* to schedule.

C. Lyon Cannot Determine whether a Scheduled Amount of Data Exceeds a Threshold Amount Corresponding to a Dynamic Weight

In claimed embodiments of the invention (e.g., claims 1, 32), data are scheduled for transmission from a memory, and the *amount* of data scheduled is compared to a threshold corresponding to a dynamic weight assigned to the memory.

The "exceeded threshold" in Lyon, as discussed above, relates to a threshold in a virtual output queue for dividing the queue into bandwidth priority levels. The thresholds do not indicate *how much* data to act upon, and there is no indication that the thresholds are dynamic. When a threshold is exceeded, as determined by the number of cells queued, an input port starts discarding incoming cells having the same or higher emission priority *and* a lower BP. Thus, Lyon's thresholds may indicate *when* to start discarding incoming (not queued) cells, but indicates nothing about *how many* cells to discard.

Cell BPs are assigned automatically, based on their loss and emission priorities, and are not dynamic.

D. Lyon Does Not Repeatedly Service Memories if an Amount of Data Scheduled is Less than a Threshold

In claimed embodiments of the invention (e.g., claims 1, 32), specified states (i.e., states (a) through (d)) are repeated for successive descriptors in a memory. As described above, Lyon neither retrieves descriptors nor retrieves or schedules data described by descriptors. Therefore, Lyon cannot repeat such actions.

Yet further, if the number of cells in a virtual queue in Lyon does *not* exceed one of the thresholds that divide the queue into bandwidth priority levels, the methods proposed by Lyon are apparently *not* applied. Thus, Lyon teaches away from this aspect of Applicant's invention.

E. Lyon Does Not Decrease a Threshold

In claimed embodiments of the invention (e.g., claims 1, 32), if the amount of data scheduled from a memory exceeds a threshold, that threshold is decreased for a subsequent servicing of the memory.

In contrast, the thresholds in Lyon used to define bandwidth priority levels in a virtual queue are apparently static. There is no teaching or suggestion to alter them. Thus, Lyon also teaches away from this aspect of Applicant's invention.

F. Lyon Cannot Determine whether a Dynamic Weight has Changed

In a claimed embodiment of the invention (e.g., claim 3), it is determined whether a dynamic weight associated with a memory has changed.

The Examiner equated Applicant's dynamic weight with Lyon's bandwidth priority (BP) (Official Action, page 3, lines 5-6). However, as described above, the bandwidth priorities assigned to incoming cells are apparently static (*see* TABLE 1, TABLE 3). Similarly, the bandwidth priority levels in virtual queues also appear to be static (column 11, lines 8-21).

Thus, Lyon does not and *cannot* determine whether a dynamic weight – a weight used to determine how much data to schedule – has changed.

G. Lyon Does Not Employ Dynamic Weights

In a claimed embodiment of the invention (e.g., claim 9), weights indicating how much data may be scheduled from a memory are dynamic.

The Examiner equated Applicant's dynamic weight with Lyon's bandwidth priority (BP) (Official Action, page 3, lines 5-6). However, as described above, the bandwidth priorities assigned to incoming cells are apparently static (*see* TABLE 1, TABLE 3). Similarly, the bandwidth priority levels in virtual queues also appear to be static (column 11, lines 8-21).

In rejecting this element, the Examiner stated that "the number of cells is dynamically modifiable through discarding." This is incorrect. First, Lyon's count of cells refers to cells queued in an output queue. None of these cells are discarded; only *incoming* cells are discarded, at the input ports (column 8, lines 19-38), and therefore the number of cells in an output queue will not be modified through discarding. Second, the Examiner previously equated Applicant's dynamic weights with bandwidth priorities (Official Action, page 3, lines 5-6). As described

above, BPs are not dynamic.

II. Selected Claims

Claims 1-3, 5-10, 32

The rejections of claims 1-3, 5-10 and 32 are traversed for the reasons stated above.

CONCLUSION

No new matter has been added with the preceding amendments. It is submitted that the application is in condition for allowance. Such action is respectfully requested. If prosecution of this application may be facilitated through a telephone interview, the Examiner is invited to contact Applicant's attorney identified below.

Respectfully submitted,

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